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SOME EFFECTS OF HOT CLIMATIC CONDITIONS ON
BRAHMAN X FRIESIAN AND FRIESIAN CALVES
FED HIGH AND LOW ROUGHAGE RATIONS

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ABSTRACT

The experiment consists of two parts: the Main trial and Radiant heat stress trial.

1. Main Trial. The effects of temperature, breed type, diet types and their interactions on feed intake, digestibility, liveweight gain (LWG) and Water intake were examined in the Main trial. Eight Friesian (F) and eight Brahman x Friesian (BF) castrated male calves (6 months old) were allocated to be fed on the High ration (pellets ad lib. + 10% of the total feed dry matter as hay) and the Low ration (hay ad lib. + 10% of the total feed dry matter as pellets), and to be kept in a hot room (34.5°C, 45% RH) OR a cool room (16.9°C, 86% RH) for a period of 59 days. There were eight individual treatments, with two animals on each treatment.

The calves in the hot room had a significantly lower dry matter intake (DMI), digestible energy intake (DEI) and LWG than those in the cool room. The calves fed on the High ration had a significantly higher DMI, DEI and LWG than those fed on the Low ration. BF calves had a significantly higher DMI, DEI and LWG than F calves when fed the High ration in both the hot and cool rooms, but the two breeds had very similar feed intakes and LWG when fed the Low ration.

In the hot room, there was a slight but significant increase in dry matter and energy digestibilities, but not apparent nitrogen digestibility.

The Water intake was significantly higher in the hot room than in the cool room. The water intake by BF calves fed the High ration was significantly higher than other treatments due to their higher DMI. The calves fed the High ration had a significantly higher water intake than those fed on the Low ration in the hot room and this was also mainly a reflection of the higher DMI by calves fed the High ration.

2. Radiant Heat Stress Trial. The effects of exposure to simulated sunshine on feed and water intakes were investigated in this trial. Six animals (4 BF, 2 F) from the hot rooms in the Main Trial were exposed to a radiant heat load for 8h daily during a period of two weeks, followed or preceded by a period of two weeks in the absence of a radiant heat load in a hot environment (30.0 - 33.1°C) and fed on a high roughage diet (500g pellets + hay ad lib.).

There was no significant reduction in DMI or increase in water intake when the calves were exposed to the radiant heat load in a hot environment.

In both the Main and Radiant Heat Stress Trials, the rectal temperature as heat stress indicator did not correlate well with the DMI and LWG of BF and F calves under heat stress.